



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|-----------------------|---------------------|------------------|
| 10/083,450 | 02/25/2002 | Viraraghavan S. Kumar | 204.021700 | 8317 |

7590 02/09/2004

THE BILICKI LAW FIRM, P.C.
Furniture Mart Building
Suite 1000
111 West Second Street
Jamestown, NY 14701

EXAMINER

RIVELL, JOHN A

ART UNIT PAPER NUMBER

3753

DATE MAILED: 02/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/083,450

Applicant(s)

KUMAR, VIRARAGHAVAN S.

Examiner

John Rivell

Art Unit

3753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/25/02(app), 8/19/02- 7/7/03 (IDS).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,4 6) ☐ Other: _____

Claims 1-20 are pending.

Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).

The drawings are objected to as set forth on the attached Draftsperson's Review PTO-948.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Numeral "252" used on page 13 describing the "retaining ring", numeral "342" used on page 15 and 17 describing the "relatively thin portion" of the pole piece (although figure 2 contains a numeral and reference line for this "thin portion" it is not clear whether the numeral is supposed to read --342-- or -- 347--), numeral "350" used on page 19 describing the "annular groove" for seal 348, numeral "376" used on page 22 describing the "valve seat" in figs. 3 and 4, numeral "386" uses on page 22 describing the "retention washer".

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The disclosure is objected to because of the following informalities: The specification is replete with the recitation "...my above referenced application '***'". The appropriate application information should be provided.

On page 7, lines 10-14 include an open ended parenthetical expression. On page 12, line 22, "222" should read -- 218 --. On page 16, line 19, "336" should read -- 335 --.

Appropriate correction is required.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically, the specification is non enabling for the embodiment of invention in which the "restriction" element such as diaphragm 242 and O-ring seal 362 are eliminated, e.g. the embodiment of fig. 4. In this embodiment the disclosed "very narrow annular aperture 400" will, in the closed position of the valve, permit the application of fluid pressure across the entire valve from the inlet to the outlet with no isolating element therebetween. As such, inlet fluid pressure acting on the underside of the valve face will progress through the orifice in the valve to the "solenoid cavity" of the valve, through the "narrow aperture" and then to the outlet, creating leakage across the valve and failing to be "balanced" across the valve and thus never equalize to result in a "balanced" condition of the valve as disclosed.

The rejections made below concerning those claims directed to the embodiment of figure 4 are made in the interest of expediting prosecution.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 4 and 15 are rejected under 35 U.S.C. §102 (b) as being anticipated by Osumi et al. (4,953,825 cited by applicant)

The patent to Osumi et al. discloses “a solenoid-actuated valve assembly comprising: a solenoid coil (4) adapted to generate a magnetic field, and having a longitudinal axis and a bore coaxial therewith; an axially movable armature (3) of magnetic material, supported within an armature cavity for axial translation along said longitudinal axis; a magnetic pole piece (5) disposed within the bore of said solenoid coil and being magnetically coupled with said axially movable armature (3); a valve unit (1), mechanically coupled with said axially movable armature (3), and having a fluid cavity coupled in fluid communication with a fluid inlet port (8 or 9) to which fluid is applied at a first fluid pressure, and a fluid exit port (9 or 8) from which said fluid is output at a second fluid pressure, and containing a valve seat (face 22 on the right end of boss 21) therebetween, which is adapted to be closed by a valve closing assembly that includes a valve poppet (plate 1a) coupled with said moveable magnetic armature (3), so as to regulate fluid flow between said fluid inlet port and said fluid exit ports; and a fluid pressure balancing arrangement (diaphragm 2, open to the inlet/outlet cavity 8 and the inlet/outlet port 9 by passage 14 through the valve assembly) adapted to compensate for said first and second fluid pressures being exerted against said valve

poppet, and comprising a fluid flow restriction (around the outside of armature 3) between said armature cavity and said fluid cavity, and a fluid communication path (see passage 11) through said valve closing assembly and providing fluid communication between said fluid exit port and said armature cavity" as recited in claim 1.

Regarding claim 3, in Osumi et al. "said fluid flow restriction comprises a fluid seal element (diaphragm 22), coupled between said valve closing assembly (armature 3) and said valve unit (1) in a manner that prevents fluid communication between said inlet port and said armature cavity" as recited.

Regarding claim 4, in Osumi et al., "said fluid seal element comprises a diaphragm" 22 as recited.

Regarding claim 15, in Osumi et al., "said axially moveable armature (3) is spring-supported outside (by "outside" spring 15) said bore for axial translation relative to said magnetic pole piece" 5 as recited.

Claim 1 is further and claims 3 and 5 are rejected under 35 U.S.C. §102 (b) as being anticipated by Gardner.

The patent to Gardner discloses "a solenoid-actuated valve assembly comprising: a solenoid coil (32) adapted to generate a magnetic field, and having a longitudinal axis and a bore coaxial therewith; an axially movable armature (72) of magnetic material, supported within an armature cavity for axial translation along said longitudinal axis; a magnetic pole piece (52) disposed within the bore of said solenoid coil and being magnetically coupled with said axially movable armature (72); a valve unit (22, 70), mechanically coupled with said axially movable armature (72), and having a fluid cavity coupled in fluid communication with a fluid inlet port (12) to which fluid is

applied at a first fluid pressure, and a fluid exit port (14) from which said fluid is output at a second fluid pressure, and containing a valve seat (20) therebetween, which is adapted to be closed by a valve closing assembly (at O-ring 30) that includes a valve poppet (22) coupled with said moveable magnetic armature (72), so as to regulate fluid flow between said fluid inlet port (12) and said fluid exit ports (14); and a fluid pressure balancing arrangement (at bleed passage 76 and seal element 38) adapted to compensate for said first and second fluid pressures being exerted against said valve poppet, and comprising a fluid flow restriction (at seal 38) between said armature cavity and said fluid cavity, and a fluid communication path (see passage 76) through said valve closing assembly and providing fluid communication between said fluid exit port and said armature cavity" as recited in claim 1.

Regarding claim 3, in Gardner "said fluid flow restriction comprises a fluid seal element (O-ring 38), coupled between said valve closing assembly and said valve unit in a manner that prevents fluid communication between said inlet port and said armature cavity" as recited.

Regarding claim 5, in Gardner, "said fluid seal element comprises an O-ring" at O-ring 38 as recited.

Claim 1 is further and claim 2 (relative to the above concerning §112 (1st para. above) is rejected under 35 U.S.C. §102 (b) as being anticipated by Toshio et al.

The patent to Toshio et al. discloses "a solenoid-actuated valve assembly comprising: a solenoid coil (6) adapted to generate a magnetic field, and having a longitudinal axis and a bore coaxial therewith; an axially movable armature (1) of magnetic material, supported within an armature cavity for axial translation along said

Art Unit: 3753

longitudinal axis; a magnetic pole piece (3, at face 3a) disposed within the bore of said solenoid coil and being magnetically coupled with said axially movable armature (1); a valve unit (body 4 and poppet 2) mechanically coupled with said axially movable armature (1), and having a fluid cavity coupled in fluid communication with a fluid inlet port (4b or 4c) to which fluid is applied at a first fluid pressure, and a fluid exit port (4c or 4b) from which said fluid is output at a second fluid pressure, and containing a valve seat (4d) therebetween, which is adapted to be closed by a valve closing assembly (valve head of poppet 2) that includes a valve poppet (2) coupled with said moveable magnetic armature (1), so as to regulate fluid flow between said fluid inlet port and said fluid exit ports; and a fluid pressure balancing arrangement adapted to compensate for said first and second fluid pressures being exerted against said valve poppet, and comprising a fluid flow restriction (the passage between the external surface of stem 2 and the internal diameter of sleeve 3) between said armature cavity and said fluid cavity, and a fluid communication path (2c) through said valve closing assembly and providing fluid communication between said fluid exit port and said armature cavity" as recited in claim 1.

Regarding claim 2, in Toshio et al., "said fluid flow restriction comprises a generally annular-shaped passageway adjacent to said valve closing assembly and extending between said armature cavity and said fluid cavity.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 16, 17, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brehm (5,427,352 cited by applicant) in view of Osumi et al.

The patent to Brehm ('352) discloses "a solenoid-actuated valve assembly comprising a solenoid coil (15) having a longitudinal axis and a solenoid cavity coaxial therewith, said solenoid coil (15) producing a magnetic field, a magnetic pole piece (13) including an axial portion thereof supported within said solenoid cavity exclusive of the use of non-magnetic material, and an armature (at 23 and upper closure plate 35) axially translatable relative to and axially (between face 38 of plate 35) and radially (between the radial, peripheral surface of plate 35 and the internal, radially inward face of cavity 37) magnetically coupled with said magnetic pole piece (13), while being supported with said magnetic pole piece..."

Thus Brehm ('352) discloses all the claimed features with the exception of having "the armature supported... by a fluid flow restriction that restricts fluid flow with said solenoid cavity and having an internal bore therethrough providing fluid communication with said solenoid cavity".

The patent to Osumi et al. discloses that it is known in the art to employ "an armature (3) axially translatable relative to... (a)magnetic pole piece (5), while being supported with said magnetic pole piece by a fluid flow restriction (diaphragm 22 and passage 11) that restricts fluid flow with said solenoid cavity and having an internal bore therethrough providing fluid communication with said solenoid cavity" for the purpose of providing a solenoid operated valve device pressure balanced against both upstream and downstream fluid pressure forces. That is the effect on the valve element of the fluid pressure in either the upstream or downstream conduit is balanced.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Brehm ('352) a valve element including an

armature supported with said magnetic pole piece by a fluid flow restriction that restricts fluid flow with said solenoid cavity and having an internal bore therethrough providing fluid communication with said solenoid cavity for the purpose of providing a solenoid operated valve device pressure balanced against both upstream and downstream fluid pressure forces as recognized by Osumi et al.

Regarding claim 17, the device of Osumi et al. includes "a valve unit (1), mechanically coupled with said armature (3), and having a fluid cavity coupled in fluid communication with a fluid inlet port (8 or 9) to which fluid is applied at a first fluid pressure, and a fluid exit port (9 or 8) from which said fluid is output at a second fluid pressure, and containing a valve seat (at face 22 of boss 21) therebetween, which is adapted to be closed by a valve closing assembly that includes a valve poppet (1a) coupled with said moveable magnetic armature (3), so as to regulate fluid flow between said fluid inlet port and said fluid exit ports, and wherein said fluid flow restriction (diaphragm 22 and passage 11) is configured to balance fluid pressures at the fluid inlet and exit ports applied to the opposite sides of said fluid flow restriction, in a manner that is complementary to the fluid pressures applied to opposite sides of said valve poppet, thereby effectively neutralizing the effects of fluid pressure on poppet position" as recited.

Regarding claim 19, in Osumi et al., "said fluid flow restriction comprises a fluid seal element" at diaphragm 22 as recited.

Regarding claim 20, in Osumi et al., "said fluid seal element comprises one of a diaphragm and an O-ring", here diaphragm 22 as recited.

Claims 16-17 are further, and claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brehm (5,427,352 cited by applicant) in view of Toshio et al.

The patent to Brehm ('352) discloses "a solenoid-actuated valve assembly comprising a solenoid coil (15) having a longitudinal axis and a solenoid cavity coaxial therewith, said solenoid coil (15) producing a magnetic field, a magnetic pole piece (13) including an axial portion thereof supported within said solenoid cavity exclusive of the use of non-magnetic material, and an armature (at 23 and upper closure plate 35) axially translatable relative to and axially (between face 38 of plate 35) and radially (between the radial, peripheral surface of plate 35 and the internal, radially inward face of cavity 37) magnetically coupled with said magnetic pole piece (13), while being supported with said magnetic pole piece..."

Thus Brehm ('352) discloses all the claimed features with the exception of having "the armature supported... by a fluid flow restriction that restricts fluid flow with said solenoid cavity and having an internal bore therethrough providing fluid communication with said solenoid cavity".

The patent to Toshio et al. discloses that it is known in the art to employ a solenoid-actuated valve including an "armature supported... by a fluid flow restriction (an annular passage between the internal diameter of sleeve 3 and the external diameter of valve poppet 2 and passage 2c through the valve head) that restricts fluid flow with said solenoid cavity and having an internal bore therethrough providing fluid communication with said solenoid cavity" for the purpose of providing a solenoid operated valve device in which the effects of fluid pressure on the valve element from both the upstream and downstream direction is balanced.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in Brehm ('352) an armature supported by a fluid flow restriction that restricts fluid flow with said solenoid cavity and having an internal bore therethrough providing fluid communication with said solenoid cavity for

the purpose of providing a solenoid operated valve device in which the effects of fluid pressure on the valve element from both the upstream and downstream direction is balanced as recognized by Toshio et al.

Regarding claim 17, Toshio et al. discloses "a valve unit (at body 4), mechanically coupled with said armature (1), and having a fluid cavity coupled in fluid communication with a fluid inlet port (4b or 4c) to which fluid is applied at a first fluid pressure, and a fluid exit port (4c or 4b) from which said fluid is output at a second fluid pressure, and containing a valve seat (4d) therebetween, which is adapted to be closed by a valve closing assembly that includes a valve poppet (2) coupled with said moveable magnetic armature (1), so as to regulate fluid flow between said fluid inlet port and said fluid exit ports, and wherein said fluid flow restriction (annular passage and passage 2c) is configured to balance fluid pressures at the fluid inlet and exit ports applied to the opposite sides of said fluid flow restriction, in a manner that is complementary to the fluid pressures applied to opposite sides of said valve poppet, thereby effectively neutralizing the effects of fluid pressure on poppet position" as recited.

Regarding claim 18, Toshio et al. discloses "said fluid flow restriction comprises a generally annular-shaped passageway (between the outer surface of poppet 2 and the inner diameter surface of sleeve 3) adjacent to said valve closing assembly and extending between said armature cavity and said fluid cavity" as recited.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double

Art Unit: 3753

patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 6-13 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3, 4, 5, 7, 11, 6, 12 and 13, respectively, of U.S. Patent No. 6,604,726 in view of Osumi et al.

The device of respective patent claims 1, 3, 4, 5, 7, 11, 6, 12 and 13, discloses all the features of current specific claims 6-13 with the exception of having "a solenoid-actuated valve assembly comprising: a solenoid coil adapted to generate a magnetic field, and having a longitudinal axis and a bore coaxial therewith; an axially movable armature of magnetic material, supported within an armature cavity for axial translation along said longitudinal axis; a magnetic pole piece disposed within the bore of said solenoid coil and being magnetically coupled with said axially movable armature; a valve unit, mechanically coupled with said axially movable armature, and having a fluid cavity coupled in fluid communication with a fluid inlet port to which fluid is applied at a first fluid pressure, and a fluid exit port from which said fluid is output at a second fluid pressure, and containing a valve seat therebetween, which is adapted to be closed by a valve closing assembly that includes a valve poppet coupled with said moveable magnetic armature, so as to regulate fluid flow between said fluid inlet port and said fluid exit ports; and a fluid pressure balancing arrangement adapted to compensate for said first and second fluid pressures being exerted against said valve poppet, and comprising a fluid flow restriction between said armature cavity and said fluid cavity, and a fluid communication path through said valve closing assembly and providing fluid

communication between said fluid exit port and said armature cavity” as recited in claim 1.

The patent to Osumi et al. discloses “a solenoid-actuated valve assembly comprising: a solenoid coil (4) adapted to generate a magnetic field, and having a longitudinal axis and a bore coaxial therewith; an axially movable armature (3) of magnetic material, supported within an armature cavity for axial translation along said longitudinal axis; a magnetic pole piece (5) disposed within the bore of said solenoid coil and being magnetically coupled with said axially movable armature (3); a valve unit (1), mechanically coupled with said axially movable armature (3), and having a fluid cavity coupled in fluid communication with a fluid inlet port (8 or 9) to which fluid is applied at a first fluid pressure, and a fluid exit port (9 or 8) from which said fluid is output at a second fluid pressure, and containing a valve seat (face 22 on the right end of boss 21) therebetween, which is adapted to be closed by a valve closing assembly that includes a valve poppet (plate 1a) coupled with said moveable magnetic armature (3), so as to regulate fluid flow between said fluid inlet port and said fluid exit ports; and a fluid pressure balancing arrangement (diaphragm 2, open to the inlet/outlet cavity 8 and the inlet/outlet port 9 by passage 14 through the valve assembly) adapted to compensate for said first and second fluid pressures being exerted against said valve poppet, and comprising a fluid flow restriction (around the outside of armature 3) between said armature cavity and said fluid cavity, and a fluid communication path (see passage 11) through said valve closing assembly and providing fluid communication between said fluid exit port and said armature cavity” as recited in claim 1 for the purpose of providing a solenoid operated valve device in which the effects of fluid

pressure on the valve element from the upstream and downstream direction are balanced.

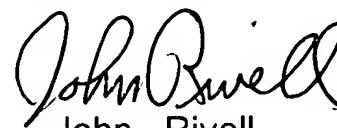
It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in the device of respective patent claims 1, 3, 4, 5, 7, 11, 6, 12 and 13 a solenoid-actuated valve assembly comprising a solenoid coil adapted to generate a magnetic field, and having a longitudinal axis and a bore coaxial therewith; an axially movable armature of magnetic material, supported within an armature cavity for axial translation along said longitudinal axis; a magnetic pole piece disposed within the bore of said solenoid coil and being magnetically coupled with said axially movable armature; a valve unit, mechanically coupled with said axially movable armature, and having a fluid cavity coupled in fluid communication with a fluid inlet port to which fluid is applied at a first fluid pressure, and a fluid exit port from which said fluid is output at a second fluid pressure, and containing a valve seat therebetween, which is adapted to be closed by a valve closing assembly that includes a valve poppet coupled with said moveable magnetic armature, so as to regulate fluid flow between said fluid inlet port and said fluid exit ports; and a fluid pressure balancing arrangement adapted to compensate for said first and second fluid pressures being exerted against said valve poppet, and comprising a fluid flow restriction between said armature cavity and said fluid cavity, and a fluid communication path through said valve closing assembly and providing fluid communication between said fluid exit port and said armature cavity for the purpose of providing a solenoid operated valve device in which the effects of fluid pressure on the valve element from the upstream and downstream direction are balanced as recognized by Osumi et al.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Rivell whose telephone number is (703) 308-2599. The examiner can normally be reached on Mon.-Thur. from 6:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dave Scherbel can be reached on (703) 308-1272. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


John Rivell
Primary Examiner
Art Unit 3753

j.r.